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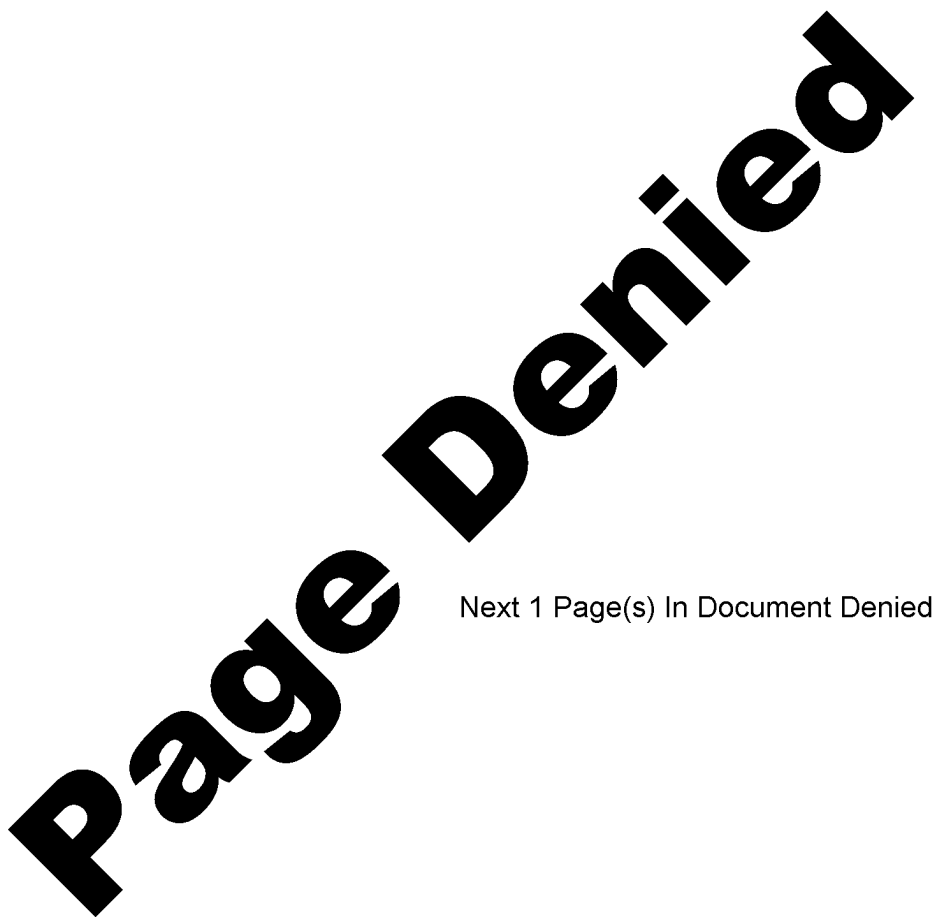

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THE CHINESE FERTILIZER INDUSTRY IS IN FULL SWING

by

Hsu Chien

Only about ten years ago, the Chinese chemical fertilizer industry was all but nonexistent. Its expansion appeared to be the only means of eliminating the insufficiency of cultivatable land relative to the population.

Considerable progress has already been made within the framework of the first five year plan, but it is almost insignificant compared with the immense construction program which China has undertaken. This includes expansion of old installations and the erection of a multitude of new plants, large and small, producing a greater variety of fertilizer compounds.

During the period which preceded the liberation, the Chinese market was dominated by the products of the British monopoly of Imperial Chemical Industries. Although China is essentially an agricultural country, it began to manufacture its own chemical fertilizers only about 20 years ago.

The first fertilizer plant in China, the private installation of the chemical works, Yung Li, was established at Nanking at the beginning of 1937. Its predicted annual production capacity was 50,000 tons of nitrogen fertilizer consisting of ammonium sulphate; but before six months had elapsed, it was deliberately destroyed by Japanese bombers at the time of the attack on Shanghai by the Japanese militarists, August 13, 1937. At almost the same time, the Manchurian Chemical Company, a Japanese company, constructed a factory at Dairen, in the northeast; but it was not used for Chinese agriculture, for almost all of its production was sent to Japan.

At the moment of the victory over the Japanese, China found itself at the head of this factory at Dairen and the ruins of the chemical installations at Nanking. The factory at Dairen had been so damaged by the occupants at the end of the Japanese occupation that the Kuomintang did not even try to restore production. The Nanking factory was progressively reconditioned, but lack of fuel and raw material never permitted it to exceed the production of 27,000 tons of ammonium sulphate which it attained in 1949, the year that the country was liberated.

Thus practically no chemical fertilizer industry existed in China before the liberation of the country. In addition, the country lacked the foreign exchange to import the large quantities of these products which were so necessary to the life of the nation. Moreover, even if one had been able to produce or import them, the buying power of the peasant was very low and he was little inclined to buy them and use them. Traditionally, the Chinese peasant has used only farm manure and fecal materials; and although he may be very skilled in their preparation and use, these means were tragically inadequate relative to the needs of the country.

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[redacted] beginnings, the new regime recognized the importance of the creation of a chemical fertilizer industry. The Japanese had planned to prevent restoration of the plant at Dairen for at least ten years. Actually, it was rebuilt in May, 1951 and enlarged two years later. The chemical works Yung Li at Nanking, which had become a joint enterprise with participation of the State, was similarly developed. The annual production of these two installations is several times the highest figures attained before the liberation, without taking into account the important improvement in the quality of their products. The chemical plant at [redacted] produces 250,000 tons per year and that at Yung Li 270,000 tons.

China is certainly not content with these two factories. Within the framework of the last five year plan of economic development new factories, large and small, have been built in all parts of the country. One nitrogen fertilizer plant has been constructed and placed in operation at Kirin, in northeast China, with the aid of the U.S.S.R; it is equipped according to the latest technology, its production is electrically controlled, and the machines are protected and sheltered from explosions. Work has begun on three other similar factories of large capacity and of modern design. The equipment necessary for an annual production of 200,000 tons of powdered superphosphate has been furnished for a large phosphate fertilizer factory which is now under construction in Manchuria. It will be the first of its type in China.

Six other factories of smaller capacity, about 10,000 tons per year, have likewise been constructed in different provinces. In 1957, Chinese production reached 800,000 tons of chemical fertilizer, about 3-1/2 times the highest figure registered before the liberation. But this represents only a fraction of the real needs of the country; it is only a beginning.

China uses only a small area of cultivatable land relative to its enormous population; the average land under cultivation is about 1/5 of a hectare (1/2 acre) per inhabitant. In order that China can progress economically, it is of vital importance that she increase her production of agricultural commodities and although certain results in this direction can be achieved by the more costly method of clearing land, it is evident that the use of chemical fertilizer in larger quantities on the lands cultivated is one of the best solutions.

By way of comparison, let us say that if one invested, for example, 2,000 million yen (about 294 million pounds sterling) in clearing land, one would obtain 1,900,000 cultivatable hectares which would add about 2,150,000 tons of grains. If one invested this sum in the chemical fertilizer industry, the additional production of 4-1/2 million tons of fertilizer per year which would result from it would add 12,750,000 tons of grains annually. In other words, one would obtain six times the increase obtainable by clearing land.

Based on such considerations, China has revised its agricultural program; discussions on this subject have taken place in the whole region, and the second five year plan which went into effect in January 1958, places a considerable emphasis on the chemical fertilizer industry. Attractive objectives have been established: 5-7 million tons [redacted]962 at the end of the second five year plan and approximately 15 million tons [redacted] the third five year plan in 1967.

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In order to realize these objectives an immense construction program is under study.

The existing installations are being enlarged, new factories are being constructed, and the cities, provinces and departments are being encouraged to construct the largest possible number of small or medium size plants. In order to hasten the fulfillment of this program, some typical plans for installations have been worked out; the construction of very small plants according to these designs requires only six months, and 15 months for medium size plants, from the beginning of work until full production. These new plants are equipped principally with material of Chinese manufacture which is now possible thanks to the development of the machine construction industry.

Production will not merely be considerably increased at the end of the second five year plan in 1962; the variety of fertilizers will likewise be larger, encompassing ammonium chloride, urea, calcium cyanamid and the triple superphosphates, as well as ammonium sulphate and calcium superphosphate which China produces already.

Just for the year 1958, besides the four large fertilizer factories which were already under construction at the beginning of the year, one has undertaken the expansion of three existing plants and the construction of ten new plants situated in the grain producing provinces. The funds devoted to the fertilizer industry in 1958 should have been double those of the preceeding year and have approached the total of the four years from 1953 to 1956. These seventeen plants will add an annual production of 1,688,000 tons of nitrogen fertilizer (expressed as ammonium sulphate), 800,000 tons of phosphate fertilizer and 100,000 tons of calcium nitrate.

In order to respond to the urgent demands which are resulting from the unprecedented progress in agricultural production, the Minister of the Chemical Industry has worked out plans for the establishment of a small fertilizer factory in each of the 180 administrative regions of the country (an administrative region includes several districts) and of a smaller one of each of the 2,000 districts, to be based on a pilot plant, construction of which was started in Peking at the beginning of April. This pilot plant will furnish not only data on standard type installations, but will likewise permit acquiring experience in their construction and in the training of technical operating personnel.

One type of plant project which is under consideration by the Minister of the Chemical Industries anticipates for a district a small plant with an annual production capacity of 8,000 tons of ammonium bicarbonate. It can be constructed in about six months, it will occupy a surface of 2/3 of a hectare and will cost, according to estimates, about 3.5 million yen (or 500,000 pounds sterling), in this estimate is included 1 million yen for an installation producing the power necessary for the plant. This total price is actually within the reach of average districts in China. The training of operating personnel requires little time, for the manufacturing procedures will be simplified. For the constructing of these plants, one can employ abundant manual labor in place of machines; and wood and bamboo replace iron and steel as much as possible.

The typical plan for a larger plant, destined for an administrative region visualizes an annual production capacity of 40,000 tons of ammonium bicarbonate. The construction entails an expenditure of about 15 million yen, 5 million for the production of power.

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The supplying of raw materials does not present problems; the principal ones are oil, air and water, and China is finding abundant resources of oil over its whole territory. With regard to equipment, the necessary steel material can now be produced in many parts of the country.

It is sufficient to point out that if in several years only 1,000 districts construct their fertilizer factory according to these standards, production of 8 million tons will result, which will be added to the total of the production of the larger factories.

The latest plans show that in addition to the large factories underway, one will undertake very shortly in the different provinces, administrative regions and districts, construction of 21 plants averaging 100,000 tons, 7 small plants of 40,000 tons and 36 smaller plants of 8,000 tons annual production capacity. When these 64 plants and the two pilot plants at Peking and Shanghai are finished, the total production should reach more than triple the production of 1957. In taking account of these figures, one can admit that in 1962 the annual production of chemical fertilizers could rise to 10 million tons, thus exceeding the objectives of the plan. When the third five year plan comes in in force and when all the districts and all the administrative regions possess their own chemical fertilizer factories, it is foreseen that China will produce more than 30 million tons annually, that is to say a third more than the United States in 1955-1956.

In a general way, the use of 1 kg of chemical fertilizer increases the harvest of food products by 3 to 4 kg or that of cotton by 1 to 2 kg. Likewise chemical fertilizer saves manual labor; 15 kg of chemical fertilizer are easier to transport and are equivalent in efficacy to 1.5 tons of compost. Nevertheless the uses of composts and other organic manures will not be neglected in spite of the increase foreseen for the production of chemical fertilizer, for the fertilizer needs of all types are almost limitless in China.

The Chinese cooperative farms in certain provinces are so enthused by the prospects of increasing their yields that they are not even waiting until the planned projects are realized. With their own resources they are constructing small factories or work shops for the production of composts or chemical fertilizers, bacterial or other. In the Se-tch'oan, the Chinese province having the largest production of grains, the cooperative farms have established their own projects for the second five year plan with an estimated capital to invest of 150 million yen. In addition, more than 2,000 work shops are under construction in different villages of the outlying province of Kan-sou in northwest China.

It is by the contribution of these efforts on all levels from the village cooperative farm to the Minister of the Chemical Industry, that China intends to solve its fertilizer problem, and in that way to help raise the level of life of 600 million Chinese.

Translated From: Chimie et Industrie, May, 1959 pp 633-636.

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